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SCIENCE

FRIDAY, FEBRUARY 18, 1916

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UPBUILDING NATIONAL VITALITY— THE NEED FOR A SCIENTIFIC INVESTIGATION¹

IF American democracy is to survive, it must be made more efficient—socially, industrially, politically. If Americans are to work out their national destiny unvexed and unhampered by foreign interference or domination, they must no longer endure the hazard of unguarded peace.

These conclusions—right or wrong—have been firmly fixed in the minds and hearts of a vast number of Americans.

For many months they have observed the great Christian nations of Europe rending one another with the ferocity of wild beasts—a savage, brutalizing struggle to destroy life and property, to increase human pain and suffering. The awful horror of it, the appalling cost of it in men, money and misery has passed beyond the grasp of the imagination.

Civilization's guarantees against such a man-made calamity have been dishonored, treaties torn up, the laws of common humanity and of God designedly outraged, and the rule of the sword substituted.

On one flank America has this extraordinary recrudescence of the spirit of national outlawry and conquest. On the other it has a rapidly advancing military power supported by an aggressive, warlike people with colonizing policies.

The possibility that American democracy may eventually be squeezed or crushed between these two great forces of militarism can no longer be ignored.

¹ Address of the chairman and retiring vice-president of Section I, the American Association for the Advancement of Science, Columbus, December 29, 1915.

Adequate national defense is the only answer to this extraordinary situation, and it must continue until the spirit of militarism and conquest is subdued in other powerful nations.

There are good-intentioned people who oppose this policy of national preparedness against war. For protection against a foreign foe they stand upon the theory:

In weakness there is strength.

They also tell us that our duty to the great brotherhood of man is higher than our duty to our country.

If we are worthy of belonging to the human species we must know that our first duty is to our own—to faithfully guard the lives and the happiness of that portion of the human family given into our care, and to religiously discharge our responsibilities as trustees for our own posterity.

However we may abhor war, it is a self-evident truth that to-day a nation without the will or the capacity to fight for its own peace, honor or national entity commands little respect at home or abroad. It has neither influence nor place in the councils of the world.

Our primary obligations to humanity and to posterity are to guard our national birthright now, and to hand down a race that will have, not only the will, but the physical power and endurance to defend and maintain our ideals, and our institutions in their full integrity.

TAKING STOCK OF NATIONAL VITALITY

Upon the health and strength of the people depend the safety of the state and the continued advance of our civilization.

With this important truth in mind, and also the constantly increasing demand for physical fitness of the individual in our industries as well as in war, let us consider some of the evidences of declining power

of our people to endure the physical stress and strain of modern life.

We will then be able to appreciate the need of a national vitality commission to study and report upon the present physical status and trend of our people. Such a commission should be authorized by congress and appointed by the President and consist of, say, fifteen members selected from a list of our most eminent authorities in this field of science.

An official body of this character would command attention and confidence. It would not only enlighten the public, but it would stimulate to action our school and health officials, and the appropriating authorities back of them, in spreading knowledge of individual hygiene and healthful living generally. This would help to check both communicable and degenerative affections which are causing such an excessive drain upon national vitality.

If the state can teach us how to combat germ diseases (which it is doing), why not organic diseases, which are virtually all preventable or deferable?

THE DECLINING DEATH RATE

Modern progress has freed us from many mental and physical burdens. It has given us wealth, comforts, luxuries, pleasures and opportunities for gaining knowledge far beyond the dreams of our forefathers. It has removed many dangers from our paths and lengthened the average years of life, all of which we gladly acknowledge.

But we must also recognize that while American life strain has decreased in some respects it has increased in others. We must admit that our civilization, in addition to its blessings, has brought us habits and hazards of life and degenerative influences which promote physical deterioration.

Many people who give little thought to

this subject insist that there is but one side to the shield. They see only where American life strain has been reduced and resent as a species of treason any reference to adverse tendencies. Naturally, this results in misunderstandings and misinterpretations of simple facts.

For instance, the average person interprets the declining general death rate and the increase in the average years of life as a sign that the race is growing stronger, that its capacity to stand the stress of modern life is increasing. The fact is overlooked that the decline in the death rate in recent years is almost wholly due to the saving of lives in infancy, childhood and early adult life from the germ diseases. These diseases are really accidents. They are not the result of the wear and tear of life. The declining death rate means, then, not that we have grown physically stronger, but that we have learned to step around certain dangers.

The advance in medical science and in general intelligence is saving lives in all age periods. But this does not indicate any gain in our vital strength. In fact, the death rate in middle life and old age from the degenerative diseases has increased steadily for years.

Another factor that is often misunderstood is the effect of the survival of the weak. Formerly only the strong survived infancy. In the past thirty-five years many lives weakened by germ diseases have been saved, and when they have had time to reach age forty and beyond they will undoubtedly affect the death rate in that period. The increase which has already occurred in the mortality rate in that period must be charged to other causes.

This low-powered group will need careful health guidance to reach middle life and is obviously an element of weakness in the upbuilding of national vitality.

THE LOW-POWERED GROUP

We rejoice over our marvelous increase in wealth and in the wonderful development of time-saving and labor-saving devices, and we would not go back to the old living conditions if we could.

We must recognize, however, that these extraordinary changes in our methods of living during the past two generations have operated greatly to disturb our race stability.

Extravagance, luxury, nervous stress and an extraordinary increase in sedentary occupations have resulted, and caused a marked increase in American life strain. In our efforts to crowd a lifetime of work and pleasures into a few years we have developed in a large number of people the intense life with its excessive indulgence, its intemperate eating, drinking, playing and living generally.

The peril of our nation in this trend is obvious to every reader of history.

In the natural order of things, there are many millions of physically substandard people in our vast population. These extraordinary changes in living conditions have apparently caused an abnormal increase in this great group of low-powered Americans.

But whether or not this impaired element is increasing, there is no questioning the assertion that this drain on the vitality of the nation, now going on from preventable cause, is excessive and should and can be checked.

INFLUENCE OF EXCESSIVE INDIVIDUALISM

In the ultra-individualist we find selfishness in the most dangerous form. He views all things from the angle of his own comfort and pleasure. He has an overpowering sense of personal independence. He flouts things sacred and semi-sacred that tend to curb it. He freely defies the laws

of health. He resents restraint in any form. A self-worshiper, neither the *good* of the majority nor the *will* of the majority claims his allegiance. He is apt to fail his country in both peace and war. He has lost the "herd spirit." His patriotism has withered and vanished under the blighting influence of love of self and of personal ease. To what extent would those afflicted with all, or a part, of the weaknesses of this product of our civilization contribute to national defense and to upbuilding the moral, the civic or the physical fitness of the race?

To this selfish, lawless spirit of the ultra-individualist which in whole or in part prevails among so many of our people, we may reasonably charge our excessive murder and suicide rate, and our indifference to the increasing waste of life from preventable accidents and disease.

It is possible that the report of the broad investigation proposed would induce the American people to place a higher value on human life.

TIME-SAVING MANIA

As a contributing cause to nerve strain and physical deterioration, our time-saving mania must not be overlooked. Those afflicted with this modern malady avoid walking and every physical movement that is not strictly necessary. The hurry habit is so firmly fastened upon us that it has changed the poise and even the manners of a vast number of people.

Thus the habit has grown upon us to express ourselves in brief, incisive terms. Abruptness enters into our personal intercourse with relatives and friends. Old-time politeness and kindly consideration for the dignity and sensibilities of others in our public and business contact is sadly lacking in many of us. The traits of calmness and deliberation seem to be deserting us and in their place we have the impera-

tive demand for hurried councils and quick judgments.

Our every need, our every sense must be served quickly or impatience and often rudeness follows. Much irritableness and bad temper are the natural consequences of such a life.

These and other habits of self-indulgence are affecting the mental poise and stability of the "strenuous" class, and largely account for the so-called "high nervous tension" under which they live. This is a serious form of life strain, and it is by no means confined to the business or well-to-do class.

This strain is bound to react sooner or later on the heart, arteries and kidneys, and especially upon the nervous system, adding to our already large family of neurasthenics. To what extent can we depend upon this particular element of our substandard citizens for the defense of the nation and the upbuilding of the race?

DISUSE OF LIMBS AND MUSCLES

The decline in physical activity has had an important bearing upon national vitality. We have millions of people, mostly bred from generations of outdoor or muscularly active ancestors, who are now working in offices, stores and the industries where little or no physical exertion or even concentration of mind is required.

It is no longer the rich who ride in "shayes." The wage-earner is whisked to and from work by electricity or gasoline. Instead of fabricating his output by physical toil, he fashions it by the simple process of feeding, watching, or adjusting a machine. A vast number of people in the rural sections, as well as in our cities, are earning their living with little or no muscular effort. This is a glorious advance over old methods, but there is the penalty. This change produces a constantly increas-

ing line of recruits for the low-powered or substandard group. Their limbs, joints and muscles were made to use. These naturally become soft and weak from disuse. To run three blocks would doubtless give the entire nation the "charley horse."

As time rolls on, the seriousness of this problem will increase, for the decline in our physical activity is bound to continue. Edison tells us invention, especially in electricity, is still in its infancy in developing time- and labor-saving methods.

OUR INDUSTRIAL ARMY

When men are wanted to fight for their country, the first consideration is health and strength of body. The initial requirement is to undergo a physical examination to determine their fitness for service. The weak are separated from the strong. The physically fit must do the fighting for the physically impaired.

And what of our great industrial army which makes the fighting army possible?

We not only have the communicable and occupational diseases and hazard of accident to combat in this group, but a marked increase in mortality from diseases of the heart and other important organs that bear the heaviest burden of life strain.

Based upon the experience of the Life Extension Institute, it is estimated that of the twenty-eight million men, age eighteen to sixty, in the United States, eight million five hundred thousand show evidences of approaching organic disease, or already have it in one or more forms.

This can only be checked and the average vitality of this group built up by teaching these people, and inducing them to observe, the laws of individual and household hygiene as applied to modern conditions. Is it not worth while?

If it is so important that our fighting men should be in good physical condition,

is it not important that the great army of workers upon whose physical fitness, skill and loyalty the fighting army must depend for existence should also be considered in our plans for national defense?

Are we to depend upon weaklings and invalids alone to feed, clothe and equip the army in the field, and to provide it with ammunition and arms?

Governmental sick insurance for workers appears to be near at hand. Sick insurance is a great need, but this is not prevention. It is relief after the damage is done. Why wait until the victim is stricken with disease before teaching him how to avoid it?

It is to reduce this vast body of substandard Americans, who are physically unable to do their full share either in the defense or the progress of the nation, that a scientific inquiry under governmental control is urged. Surely the wisdom of such an inquiry should appeal to life insurance companies and industrial employers, as well as to our military authorities.

PHYSICAL DEVELOPMENT

It is gratifying to know that interest in athletics and outdoor life has increased in recent years. But, unfortunately, the active recruits to this class have apparently not increased in proportion to the gain in population.

The growing tendency toward habits of physical ease is a dangerous factor in our civilization. Even in our schools and colleges athletics are confined chiefly to a few enthusiastic well-trained individuals. The great majority of students do not take an active part even in mild physical exercises. Their interest is often keen, but their athletics as a rule are confined to clapping their hands and exercising their vocal cords at contests where the few entertain the many. Even where the best of instructors

and equipment are provided, there are large numbers who avoid gymnasium and outdoor work and stick to the lazy line of least exertion.

We do not want and could not have a nation of highly trained athletes. What we want is a race of people who stand erect, who have good, average physiques and sound organs. A national vitality commission could study and recommend the best means of teaching our people and of stimulating them to action in this vitally important matter of exercises, and especially of natural outdoor exercise.

HIGH-POWERED SOLDIERS

Modern methods of war call for the very highest state of physical efficiency on the part of the soldier. The strain upon the physique and the nervous system is excessive.

How would our sedentary group stand it? They would doubtless do their part well, if the enemy were sufficiently obliging to allow them time to drill and harden and restore their limbs and muscles to normal condition. As to their fitness, untrained, listen to a civilian member of the Plattsburg experiment of last summer, Mr. Ralph W. Page:

THE RAW RECRUIT

. . . We advanced at top speed for miles; we crawled over ten thousand acres, and we charged until dizzy all over the country. This, my friend, is no easy task. It gives you an abnormal aspect of the real fighting man. To advance a mile on your belly or by rushes carrying thirty-eight pounds besides shooting an eight pound rifle the whole way, after a long march, even when no burst of shrapnel enhances the entertainment, is very strenuous business. . . .

Now the very essence of this [military service] is physical condition. That as a nation we are not in such condition was very strikingly shown at the maneuvers. This Plattsburg regiment was recruited largely from athletes, polo and football players, militiamen, big game hunters, and such

people probably far above the average of our citizens. They had a month's very vigorous training. And yet ten miles was the utmost limit they could cover as a body in march in one day. Yet the 30th United States Infantry two days before the amateur war began arrived at camp about 4:30 in the afternoon, the band playing "What the hell do we care," having covered thirty-two miles to a man since reveille.

If this is the experience of self-selected soldiers who undertook the work because they knew of their own trained physical condition, how long would it take to "re-build" a regiment of men from our large body of untrained citizens composed partly of men from the great physically low-powered group?

ORGANIC DETERIORATION

Apparently the most significant result of the various changes in our living habits is found in our declining power to resist the strain of life on the heart, arteries, kidneys and the nervous and digestive systems.

Compared with past decades, the increase in mortality from the early breaking down of these organs is very marked. The records of the last census show that the increase continues in the younger as well as the older age groups. This points to the shortening of the valuable productive period of life. These indications are well attested. They can not be disposed of by the easy process of denying the statistics without investigation. Nor can the extraordinary increase in cancer be explained in this convenient way.

The early breaking down of these important organs points to a decline in the vitality of our people in the mature and most useful period of their lives, and presents a phase of the problem meriting the most careful study and consideration.

THE DECLINING BIRTH RATE

That our birth rate is declining is freely conceded. The ratio of decrease we do not

know, as we have not yet reached that stage of intelligence which grasps the importance of keeping a record of the births and deaths in all sections of our country.

We know that we have made a great advance in conserving infant lives. Therefore, it may be said that if our rapidly developing civilization has operated to reduce the birth rate, it has also provided us with life-saving methods to offset the loss. But the indications are that this gain in this baby-saving is not sufficient to offset the decline in the birth rate.

The vital importance of the birth trend as a national problem is emphasized by the growing practise of birth control by parents, and by the indifference of so many of our young people to marriage. What we need is not necessarily larger families, *but more* families. The proportion of married people should have greatly increased under our new civilization. A large proportion of our 17,000,000 unmated men and women should be married. The divorce habit should have declined, but it has grown to astonishing proportions. These are all recognized facts and have a very direct bearing upon the problem of race survival, both as to quality and quantity.

Eugenics—the improvement of the breed—and the general question of race protection should receive national recognition and a sincere effort should be made to impress the public with their true purpose and importance.

WHY A NATIONAL VITALITY COMMISSION IS NEEDED

To summarize:

National liberty rests upon national vitality. The health and strength of the people are therefore fundamental factors in national defense.

Neither our freedom nor our race can be protected and developed by weak-limbed, soft-muscled, low-powered men.

Notwithstanding our progress in prevention, the physically substandard and low-powered group, which numbers millions, is apparently increasing abnormally.

The decline in the general death rate and the increase in the average length of life is due, not to an increase in the vital strength of the people, but to the fact that we are learning how to step around certain dangers—the germ diseases. The death rate from the wearing out of the organs is steadily increasing.

Some of the conditions and reasons justifying the appointment of a scientific commission to investigate and report on the trend of national vitality may be found in the following

BILL OF PARTICULARS

1. Our unprecedented prosperity and invention of labor- and time-saving devices have developed habits of extravagance, luxury, over-indulgence in both work and physical ease, which have disturbed our race stability.
2. The high-tension element is obviously increasing. Nervous strain and mental stress are constantly adding to low-powered group.
3. An extraordinary increase in sedentary life has occurred.
4. The overfed and under-exercised groups are increasing. Result: obesity and weak limbs, soft muscles—due to disuse. Easy and early victims of organic disease.
5. Prevalence of defective teeth, diseased gums (largely due to non-use of teeth), impaired vision, baldness, bad posture, flat-foot, constipation, increased by sedentary occupations.
6. A marked increase has occurred in the death rate from diseases of the nervous and digestive systems, heart and arterial system, kidneys and urinary system—19 per cent. in ten years.
7. At least 8,500,000 men (of total 28 million) age eighteen to sixty have evidences of approaching organic disease or already have it in one or more forms.
8. Health and life waste from tuberculosis, typhoid fever and other germ diseases is still excessive; about 350,000 deaths annually.
9. The mortality from cancer is rapidly increasing. Annual deaths about 75,000.
10. Accidental deaths have steadily increased and now number nearly 90,000 annually.

11. Four out of every ten deaths (all causes) are preventable.

12. Two billion dollars is the estimated annual economic waste due to preventable sickness and preventable deaths in the United States.

13. The birth rate is steadily declining—especially among the well-to-do classes—and at least 200,000 babies die every year from preventable disease.

14. There are 9,000,000 unmarried women and 5,000,000 unmarried men in the United States.

15. The divorce rate is increasing. In Chicago one suit is filed for every six marriage licenses issued.

16. Not less than 75 per cent. of school children need attention for physical defects or impairments prejudicial to health.

17. The large number of mental defectives and backward children in our schools presents a serious educational problem.

18. Idiocy and insanity are apparently increasing.

19. An enormous number of people are suffering from drug habits and alcoholism. The use of cigarettes has doubled within the past five years.

20. Medical men claim that victims of venereal disease are rapidly increasing.

21. Suicides continue to increase and have now reached the enormous total of over 15,000 annually. In ten years, 42,000 people have taken their lives in 100 cities.

22. America's murder rate is extraordinary. About 80 per million as against 7 to 20 for other nations. But a small number are punished for their crimes.

The adverse influence of this great body of physical and mental defectives upon the material, intellectual and moral advance of the nation, and upon the quality of present and future citizenship is self-evident.

We have made wonderful progress in fighting germ diseases, but no war is waged against organic diseases.

If the government may teach people sanitation—public hygiene—why not individual hygiene—the care of the body and its organs?

If it is a good thing to teach children to avoid illiteracy, why not how to avoid ill health?

If it pays to medically examine our sol-

diers periodically, why not teach the people to adopt the same health- and life-saving hygiene practise?

If we can afford to investigate the condition of swine and cattle, and of rivers and harbors for purposes of improvement, surely congress can afford to provide this National Vitality Commission to improve human efficiency and to save human life.

The primary duty of organized society is to guard the health and lives of those who compose it.

E. E. RITTENHOUSE

LIFE EXTENSION INSTITUTE

THE REVISION OF EOANTHROPUS DAWSONI

THE prehistoric archeologist sometimes uncovers strange bedfellows; no other discovery is quite so remarkable in this respect as the assemblage from the now famous gravel pit at Piltdown Common, Sussex, England. Nature has set many a trap for the scientist; but here at Piltdown she outdid herself in the concatenation of pitfalls left behind. Parts of a human skull, half of an ape-like lower jaw, a canine tooth also ape-like, flints of a pre-Chellean type, fossil animal remains, some referable to the Pliocene, others evidently Pleistocene; all at least as old as the gravel bed, some of the elements apparently derived from a still older deposit.

Has not this dazzling combination blinded the discoverers and indirectly some of their colleagues even at a distance, because of the high pitch of expectancy to which recent discoveries in the prehistoric field have, not without reason, contributed? Under the circumstances, such blindness if only temporary would be pardonable and comparatively harmless; but serious danger lurks in the possibility of its persisting long enough to become an obsession and a hindrance to future progress in this particular field.

All the cranial fragments, including the nasal bones, are human and belong evidently to the same individual. They were however so incomplete as to leave room for a difference